

**MAY 1998 CALFED ECOSYSTEM
PROPOSAL SOLICITATION
Fish Passage and Related Screen
Improvements**

**Project:
STUDY OF AUTOMATION OF
FOLSOM TEMPERATURE CONTROL
GATES**

**UNITED STATES
DEPARTMENT OF THE INTERIOR
Bureau of Reclamation
Technical Service Center
Denver Colorado**

Attachment H

COVER SHEET (PAGE 1 of 2)

May 1998 CALFED ECOSYSTEM RESTORATION PROPOSAL SOLICITATION

Proposal Title: Study of Automation of Folsom Temperature Control Gates
Applicant Name: Connie M. Berte
Mailing Address: D-8410 TSC P.O. Box 25007 Denver, Colorado 80225-0007
Telephone: 303-445-2857
Fax: _____

Amount of funding requested: \$ 117,000 for one years

Indicate the Topic for which you are applying (check only one box). Note that this is an important decision: see page ___ of the Proposal Solicitation Package for more information.

- | | |
|---|---|
| <input type="checkbox"/> Fish Passage Assessment | <input checked="" type="checkbox"/> Fish Passage Improvements |
| <input type="checkbox"/> Floodplain and Habitat Restoration | <input type="checkbox"/> Gravel Restoration |
| <input type="checkbox"/> Fish Harvest | <input type="checkbox"/> Species Life History Studies |
| <input type="checkbox"/> Watershed Planning/Implementation | <input type="checkbox"/> Education |
| <input type="checkbox"/> Fish Screen Evaluations - Alternatives and Biological Priorities | |

Indicate the geographic area of your proposal (check only one box):

- | | |
|---|---|
| <input type="checkbox"/> Sacramento River Mainstem | <input checked="" type="checkbox"/> Sacramento Tributary: _____ |
| <input type="checkbox"/> Delta | <input type="checkbox"/> East Side Delta Tributary: _____ |
| <input type="checkbox"/> Suisun Marsh and Bay | <input type="checkbox"/> San Joaquin Tributary: _____ |
| <input type="checkbox"/> San Joaquin River Mainstem | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Landscape (entire Bay-Delta watershed) | <input type="checkbox"/> North Bay: _____ |

Indicate the primary species which the proposal addresses (check no more than two boxes):

- | | |
|--|---|
| <input type="checkbox"/> San Joaquin and East-side Delta tributaries fall-run chinook salmon | |
| <input type="checkbox"/> Winter-run chinook salmon | <input type="checkbox"/> Spring-run chinook salmon |
| <input checked="" type="checkbox"/> Late-fall run chinook salmon | <input type="checkbox"/> Fall-run chinook salmon |
| <input type="checkbox"/> Delta smelt | <input type="checkbox"/> Longfin smelt |
| <input type="checkbox"/> Splittail | <input checked="" type="checkbox"/> Steelhead trout |
| <input type="checkbox"/> Green sturgeon | <input type="checkbox"/> Striped bass |
| <input type="checkbox"/> Migratory birds | |

COVER SHEET (PAGE 2 of 2)

May 1998 CALFED ECOSYSTEM RESTORATION PROPOSAL SOLICITATION

Indicate the type of applicant (check only one box):

- | | |
|--|--|
| <input type="checkbox"/> State agency | <input checked="" type="checkbox"/> Federal agency |
| <input type="checkbox"/> Public/Non-profit joint venture | <input type="checkbox"/> Non-profit |
| <input type="checkbox"/> Local government/district | <input type="checkbox"/> Private party |
| <input type="checkbox"/> University | <input type="checkbox"/> Other: _____ |

Indicate the type of project (check only one box):

- | | |
|--|---|
| <input checked="" type="checkbox"/> Planning | <input type="checkbox"/> Implementation |
| <input type="checkbox"/> Monitoring | <input type="checkbox"/> Education |
| <input type="checkbox"/> Research | |

By signing below, the applicant declares the following:

- (1) the truthfulness of all representations in their proposal;
- (2) the individual signing the form is entitled to submit the application on behalf of the applicant (if applicant is an entity or organization); and
- (3) the person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section II.K) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

Connie M. Butts

(Signature of Applicant)

D-8410

June 30, 1998

CALFED Bay-Delta Program Office
Category III Proposal Administrator
1416 Ninth Street, Suite 1155
Sacramento, California 95814

Enclosed please find 10 copies of the proposal "Study of Automation of Folsom Temperature Control Gates" submitted in response to your CALFED BAY-DELTA PROGRAM Request for Proposals: May 1998 Ecosystem Restoration Projects and Programs.

If any clarification or further information is needed on this proposal, I would be happy to respond and can be reached at 303/445-2857; FAX= 445-6469; or, Email: cberte@do.usbr.gov.

Sincerely,



Connie M. Berte
Mechanical Engineer

II. EXECUTIVE SUMMARY

A. PROJECT TITLE AND APPLICANT NAME

STUDY OF AUTOMATION OF TEMPERATURE CONTROL GATES AT FOLSOM DAM

BY CONNIE BERTE, MECHANICAL EQUIPMENT GROUP, BUREAU OF RECLAMATION

B. PROJECT DESCRIPTION AND PRIMARY BIOLOGICAL/ECOLOGICAL OBJECTIVES

Currently, the three penstock intakes are equipped with a temperature control device usually referred to as the shutter system, to conserve cold water in the reservoir. This water is later released to enhance the temperature conditions for the anadromous fish (salmon and steelhead) downstream of the dam.

The study would involve an analysis of automating the existing gates that are located on Folsom Dam that is used for controlling the temperature downstream from the Folsom Dam. This study would analysis the different methods that would enable this to be done. Do estimates on several methods to do this suggest the best method, do layouts and drawings. This automating of the gates would greatly increase the temperature control and water quality for the fish downstream of the Folsom Dam.

Currently the gates are operated by a Gantry Crane that is moved into position and then field forces have to disconnect the gates that are held in place by steel bars. They then have to connect the gates to the Gantry Crane and then lift the different gates. This type of operation requires manpower and usually takes many hours.

Automation of the existing system, would help in two ways it would increase the speed that the gates are changed. It would help control the temperature downstream of the dam. The study would help determine the most cost efficient method to do this.

C. APPROACH/TASK/SCHEDULE

1. The study would involve different ideas for automation of the gates.
2. Developing an analysis and coming up with an initial concept for the automating the gates.
3. Doing a design review by doing a Value Engineering Study involving field forces, designer, and biologist involved with the area.
4. Doing a final paper with the results of the Value Engineering Study and the designers output.

D. JUSTIFICATION FOR PROJECT AND FUNDING BY CALFED.

Automating the gates would help colder water to be saved for downstream releases through the turbine penstocks at a more ideal time for fish. Could be used for selecting different layers of water within the reservoir. Different layers have properties which are important to the water quality such as turbidity, dissolved oxygen, ph, total organic carbon and algae growth.

E. BUDGET COST AND THIRD PARTY IMPACTS

Budget cost would be the following:

- | | |
|--|----------|
| 1. Initial Engineering Study, | \$77,000 |
| 2. Value Engineering Study.- | \$35,000 |
| 3. Final Drawings and Proposed Concept - | \$50,000 |

F. APPLICANT QUALIFICATIONS

Currently working at the Bureau of Reclamation in the Mechanical Engineering Group. Have prepared computations, layouts, preliminary designs, final designs, and specifications drafts, and correspondence. Assisted in developing designs, operational procedures, procurement procedures, fabrication techniques, and installation procedures. Currently responsible for the design, specifications, drawings, DC and DOC for radial gate hoists, monorail hoists, jib cranes, gantry cranes and overhead traveling cranes.

G. MONITORING AND - DATA EVALUATION

Monitoring would include written reports at each step of the proposal. Also a CalFed person could be involved in the *Value Engineering Study* at the midpoint of the total study.

H. LOCAL SUPPORT/COORDINATION WITH OTHER PROGRAMS/COMPATIBILITY WITH CALFED OBJECTIVES

This proposal is consistent with projects that the Bureau of Reclamation has done improving water temperature downstream to help the habitat of the fish. Also consist with, increasing the number of fish now located in the rivers.

III. TITLE PAGE

STUDY OF AUTOMATION OF TEMPERATURE CONTROL GATES AT FOLSOM DAM

CONNIE M. BERTE

303-445-2857

FAX. 303/445-6469

EMAIL:cberte@do.usbr.gov

GOVERNMENT

**RFP PROJECT GROUP TYPE:PUBLIC WORKS/CONSTRUCTION
SERVICES**

IV. PROJECT DESCRIPTION

A. PROJECT DESCRIPTION AND APPROACH

Study for determining the lowest cost option for automating the TCD (temperature control device) three penstock intakes at Folsom Dam.

Currently the three penstock intakes are equipped with a temperature control device, usually referred to as the shutter system, to conserve cold water in the reservoir. This water is later released to enhance the temperature conditions for the anadromous fish (salmon and steelhead) downstream of the dam. Steelhead trout in the American River are proposed to be included on the endangered species list. There is an M&I intake also, which operates year around, is located deep in the reservoir. Its diversion of up to 475 cfs, can cause a significant impact on the cold water pool in the reservoir.

The proposal is to automate the operation of the gates on the penstock intake for ease of operation by adding hoists instead of using the existing crane and also add automated control, so to more efficiently use the different layers of the lake. A programmable logic controller (PLC) working in conjunction with a unitized (singular function) personal computer (PC) will be provided to coordinate and operate all equipment.

FOLSOM DAM PENSTOCK INTAKES

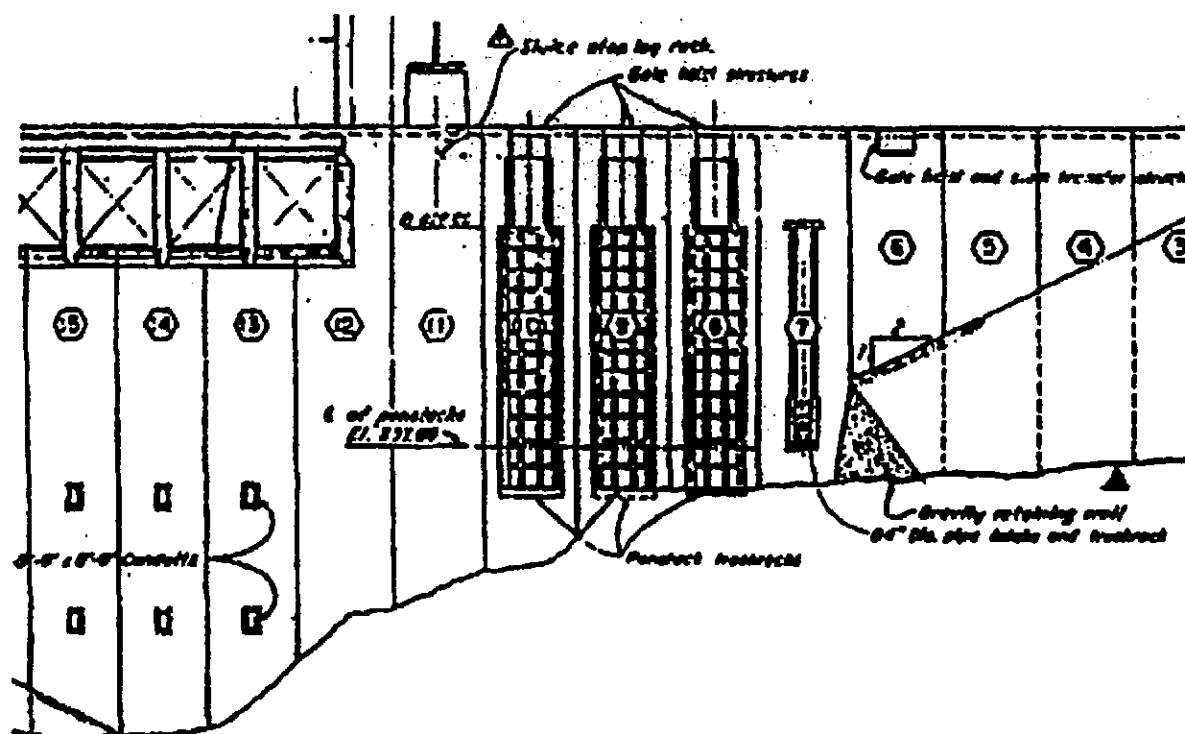
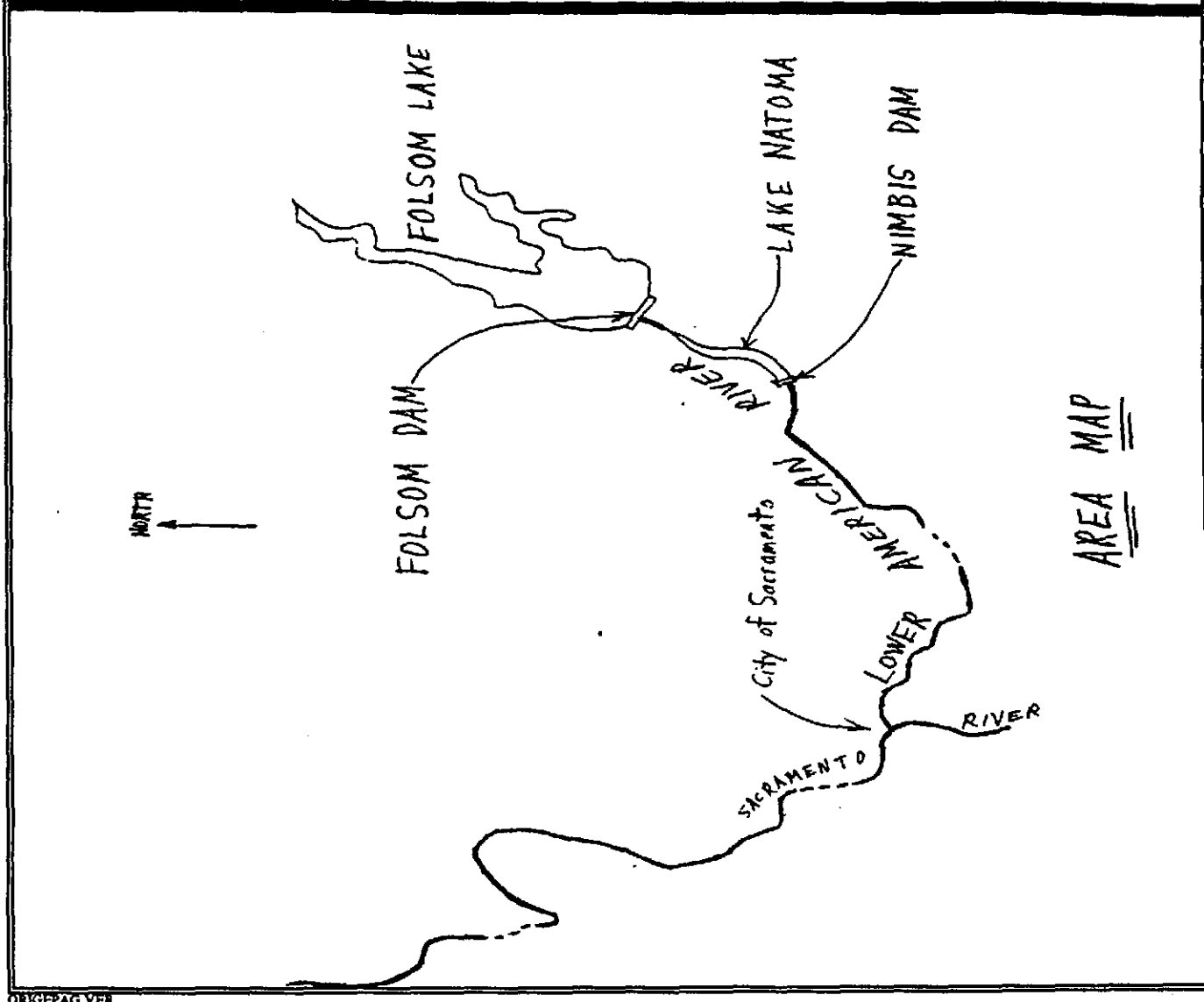


Figure 1. Folsom Dam General Location



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B. PROPOSED SCOPE OF WORK

The first step of the proposed work would be an initial design engineering study involving designing several different engineering concepts on the number on hoists and the type of automation system required, computer system, and how the computer system would coordinate with the existing controls at the Folsom Dam. This study would involve design data collection activities, collection of existing drawings, analysis of current operating data, design data report, review of design data report.

The cost of the initial engineering study would be about \$70,000.

The second step of the proposed work would be a value engineering study, analyzing the most cost effective method of automation that would be approximately one-week that would involve the Field Personnel, Denver Office, and Environmental Engineers.

The cost of the value engineering study would be about \$30,000.

The final engineering concept would involve drawings and a written concept. The final concept would be \$50,000.

C. LOCATION AND /OR GEOGRAPHIC BOUNDARIES OF THE PROJECT

The project is located on Folsom Dam (see figure 1) that is located near Sacramento California. The project is part of the American River Basin.

D. EXPECTED BENEFITS

This would improve water temperature, which is a concern for spring run of salmon due to timing of migration and spawning, especially in valley segments of the tributaries.

Populations of fish species will be enhanced annually through increased survival and health of individuals.

For the steelhead trout will able to address with reservoir management to reduce temperature for over summer rearing fish even though they are more tolerant of warm water temperatures than salmon. This would improve water quality and concerns with dissolved oxygen.

E. BACKGROUND AND ECOLOGICAL/BIOLOGICAL/TECHNICAL JUSTIFICATION

The current system has an automated system with the M&I intake. This intake withdraws the warmer waters from the reservoir when it is stratified, saving the colder waters for downstream releases through the turbine penstocks at a more ideal time for fish. At other times of the year when the reservoir is isothermal, the TCD is used for selecting different layers of water within the reservoir. These different layers have properties which are important to the water users on the M&I system such as turbidity, dissolved oxygen, PH, total organic carbon and algae growth. The automating of the TCD would improve the response time and therefore total water quality.

F. MONITORING AND DATA EVALUATION

All data and monitoring collection will be done by the current instrumentation. That is installed with the automation of the hoists such as instrumentation for water temperature, quality and turbidity.

G. IMPLEMENT ABILITY

Existing environmental compliance agreements, permits, and interagency cooperation intended to conform with relevant state and federal regulations can be extended or modified.

The automation of the shutters could be implemented easily. There would be little disruption of the current operation, of the existing shutter system during construction. After, the short duration of construction activity then the system would be able to enhance water temperature, turbidity, and quality.

The broad participation, continuous information exchange, and wide support expressed by agencies, industry, and the general public at annual technical and public meetings will continue to be promoted in this project effort.

V. COST AND SCHEDULE TO IMPLEMENT PROPOSED PROJECT

A. BUDGET COSTS

PROJECT PHASE AND TASK	DIRECT LABOR HOURS	DIRECT SALARY AND BENEFITS	OVERHEAD LABOR	SERVICE CONTRACTS	MATERIAL AND ACQUISITION CONTACTS	MISCELLANEOUS TRAVEL	TOTAL COST
INITIAL STUDY	116	35,000	35,000			\$7,000	77,000
VALUE STUDY	50	15,000	15,000			\$5,000	35,000
FINAL STUDY	84	25,000	25,000				50,000
							117,000

B. SCHEDULE MILESTONES

Initial Study to be completed by April 1, 1998.

Valve Engineering Study to be completed by June 7, 1998.

Final Engineering Study to be completed by August 7, 1998.

C. THIRD PARTY IMPACTS

Will require close coordination with the National Marine Fisheries Service. Careful coordination with Reclamation plant managers should alleviate problems.

VI. APPLICANT QUALIFICATIONS

Currently working at the Bureau of Reclamation in the Mechanical Engineering Group. Have prepared computations, layouts, preliminary designs, final designs, and specifications drafts, and correspondence. Assisted in developing designs, operational procedures, procurement procedures, fabrication techniques, and installation procedures. Currently responsible for the design, specifications, drawings, DC and DOC for radial gate hoists, monorail hoists, jib cranes, gantry cranes and overhead traveling cranes.

Responsible for the preparation of designs, correspondence, reports, manuals, and specifications for the following:

1. Hoisting equipment
2. Desalting and water treatment plant
3. Trash Removal and miscellaneous equipment
4. Fish-handling equipment
5. Flowmeter and flow-control equipment
6. Piping

VII. COMPLIANCE WITH STANDARD TERMS AND CONDITIONS

It is understood that Reclamation, as a federal agency, would submit specific documents prior to or at signing of a final contract. These documents, as understood, would be documents (Standard Clauses-Interagency), as noted in Attachment D of the 1998 CALFED Category document. Reclamation would also comply with all the "Terms and Conditions", as detailed in Attachment D.